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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/659,490	09/11/2000	Klaus Brebol	459-482P	4883

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EXAMINER

CUEVAS, PEDRO J

ART UNIT PAPER NUMBER

2834

DATE MAILED: 08/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/659,490

Applicant(s)

BREBOL, KLAUS

Examiner

Pedro J. Cuevas

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hr

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 26,28,31 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25,27,29,30,33 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 10 and 11 is withdrawn in view of the newly discovered reference(s) to Lemonon et al. Rejections based on the newly cited reference(s) follow.

Election/Restrictions

2. Newly submitted claims 26, 28, 31 and 32 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: they claim a method of operating a piezoelectric transformer.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 26, 28, 31 and 32 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9, 22-25, 27, 29, 30 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,861,704 to Kitami et al. in view of U.S. Patent No. 3,562,563 to Schafft.

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Kitami et al. clearly teaches the construction of a piezoelectric transformer with a primary portion (13) and a secondary portion (12) as shown in Figure 2, capable of generating and transforming piezoelectric vibrations in accordance with an AC Voltage fed to one portion. These piezoelectric portions are annular in shape, polarized perpendicular to the peripheral direction, adapted to operate at a resonance frequency of a dimension of a cross-section (R) of the annular body perpendicular to the peripheral direction and where the secondary portion is provided with a plurality of inner electrodes (6).

However, it fails to disclose an annular, i.e., ring shaped, body.

Schafft clearly teaches the construction of a piezoelectric transformer with a primary annular portion (11a) and a secondary annular portion (11b), capable of generating and transforming piezoelectric vibrations in accordance with an AC Voltage fed to one portion for the purpose of providing an improved high voltage transformation device and to increase the power handling capability, or as stated in Schafft's abstract, "overcoming output power limitation restrictions of a piezoelectric transformer operating in the hoop mode of vibration caused by dimensional ratio restrictions", of a ceramic ring transformer.

It would have been obvious to one skilled in the art at the time the invention was made to use the ring shape transformer disclosed by Schafft on the piezoelectric transformer disclosed by Kitami et al. for the purpose of providing an improved high voltage transformation device and to increase the power handling capability, or output power capability, of a ceramic ring transformer.

5. With regards to claims 2 and 7-9, Schafft discloses a piezoelectric transformer:

where the annular body is an annular body as shown in Figures 1-3 and 5;

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where the piezoelectric body is annular with a through-going opening as shown in Figures 1 and 3;

where the opening is a through-going opening in the thickness direction of the body as shown in Figure 1; and

where the annular piezoelectric body (11) is shaped as a hollow circular cylinder with a circular cylindrical opening having the same center as the cylindrical body as shown in Figure 3.

6. With regards to claims 3-5 and 22-24, Kitami et al. discloses a piezoelectric transformer:

where the resonance frequency of a dimension of a cross-section of the annular body perpendicular to the peripheral direction of the annular body is a resonance frequency of the thickness of the annular body;

where the primary and the secondary portions of the piezoelectric body have been polarized in the thickness direction of the piezoelectric body;

where the primary portion of the piezoelectric body has been radially polarized;

which contains a separate galvanic separation layer (37) between the primary and the secondary portions;

where the electrodes of one or both portions of the piezoelectric body are embedded in their respective portion, and where the piezoelectric material (37) between the portions and the embedded electrodes, is used as a galvanic separation while still actively participating in the power transfer; and having:

a piezoelectric body (Fig. 11);

a primary portion (1) and a secondary portion, both being able to generate and transform piezoelectric vibrations;

electrodes (6) on one or both portions of the piezoelectric body, embedded in their respective portion; and

a piezoelectric material (37) between the primary and the secondary portion to be used as a galvanic separator while still actively participating in the power transfer of the device, as shown in Figure 11.

7. With regards to claims 25, 27, 29, 30 and 33-34, Kitami et al. in view of Schafft disclose all the claimed elements, which have been treated on their merits in the previous rejection.

8. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,861,704 to Kitami et al. in view of U.S. Patent No. 3,562,563 to Schafft as applied to claims 1-9 and 22-24 above, and further in view of U.S. Patent No. 4,284,921 to Lemonon et al.

Kitami et al. in view of Schafft, discloses the claimed invention except for a piezoelectric transformer where:

the annular piezoelectric body is shaped as a double cone having its largest diameter at or close to the middle of the body, and

the opening is shaped as a double cone having its smallest diameter at or close to the middle of the body.

Lemonon et al. teach the use of a conical thermoformed protuberance in the construction of a polymeric piezoelectric transducer for the purpose of detecting and generating elastic compression waves, for infrared radiation, and for storing electrical energy.

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It would have been obvious to one skilled in the art at the time the invention was made to use the conical thermoformed protuberance disclosed by Lemonon et al. on the piezoelectric transformer disclosed by Kitami et al. in view of Schafft for the purpose of detecting and generating elastic compression waves, for infrared radiation, and for storing electrical energy.

9. Claims 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,861,704 to Kitami et al. in view of U.S. Patent No. 3,562,563 to Schafft as applied to claims 1-9 and 22-24 above, further in view of common knowledge in the art.

Kitami et al. in view of Schafft, discloses the claimed invention except for a piezoelectric transformer where:

the ratio b/h between width b of the wall of the annular body and the height h of the wall of the annular body (the thickness of the annular body) is at the most 0.25,

the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 0.5,

the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 1,

the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 1.5,

the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 2,

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the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 3, and

the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is at least 5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to:

select the ratio b/h between width b of the wall of the annular body and the height h of the wall of the annular body (the thickness of the annular body) of a piezoelectric transformer to be at the most 0.25,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 0.5,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 1,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 1.5,

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 2,

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select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 3, and

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be at least 5;

since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

10. With regards to claim 13, Kitami et al. in view of Schafft, discloses the claimed invention except for a piezoelectric transformer, where:

the ratio b/h is between 0.35 and 0.8,

the ratio b/h is between 0.4 and 0.7, and

the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening is in the interval of 1-5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to:

select the ratio b/h is between 0.35 and 0.8,

select the ratio b/h to be between 0.4 and 0.7, and

select the ratio o/b between the transverse dimension o of the opening of the annular body and the width b of the wall part of the body surrounding the opening to be in the interval of 1-5;

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since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Response to Arguments

11. Applicant's arguments filed June 13, 2002 have been fully considered but they are not persuasive.

12. In response to applicant's argument that Kitami operates in the longitudinal mode, and is solving a complete different problem, namely reducing stress and/or noise, whereas Schafft operates in the hoop mode, and is trying to increase voltage and/or power; it should be emphasized that "apparatus claims must be structurally distinguishable from the prior art."

MPEP 2114. In re Danly, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959) it was held that apparatus claims must be distinguished from prior art in terms of structure rather than function.

In Hewlett-Packard Co v Bausch & Lomb Inc., 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), the court held that: "Apparatus claims cover what a device is, not what it does." (emphases in original). To emphasize the point further, the court added: "An invention need not operate differently than the prior art to be patentable, but need only be different" (emphases in original). That is, in an apparatus claim, if a prior art structure discloses all of the structural elements in the claim, as well as their relative juxtaposition, then it reads on the claim, regardless of whether or not the function for which the prior art structure was intended is the same as that of the claimed invention.

13. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on

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obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

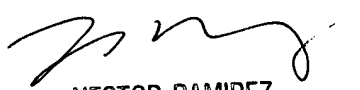
14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892, which was send with the replaced Office Action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (703) 308-4904. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor R. Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-1341 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Pedro J. Cuevas
August 6, 2002


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